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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/612,182	07/07/2000	Claus Zurbig	2198/0H294	9080

7590 12/09/2003  
Darby & Darby PC  
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EXAMINER

BISSETT, MELANIE D

ART UNIT PAPER NUMBER

1711

DATE MAILED: 12/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/612,182

Applicant(s)

ZURBIG ET AL.

Examiner

Melanie D. Bissett

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 16-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 28-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

1. The claims have been amended to contain limitations to a ratio of primary to secondary functional groups. Upon reconsideration and the finding of new art, the claims have been rejected. This action is non-final.
2. The indicated allowability of claims 6-7 is withdrawn in view of the newly discovered reference(s) to Oertel and Fishbein et al. Rejections based on the newly cited reference(s) follow.

***Response to Amendment***

3. The examiner has noted errors in the amendment format, which should be taken into consideration in the response to this action. First, claim 1 is written as "Previously Amended". However, a review of claim 1 shows matter not previously included in claim 1, namely the limitation incorporated from previous claim 6. It is the examiner's position to treat the claim as "Currently Amended". In future amendments, added limitations should be underlined.
4. Claim 6, listed as "Currently Amended", has been written in independent format. In future amendments, all new language written in a given claim should be underlined.
5. Finally, the examiner notes that claim 21 has been amended but is not labeled "Currently Amended".

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-15 and 28-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claims 1 and 6 recite "primary and/or secondary hydroxyl functional end groups" but follows with a ratio of primary to secondary end groups. Thus, by the use of "and/or" it is unclear whether the applicant intends to limit the polyol to contain both primary and secondary end groups. Because the ratio of primary to secondary end groups has been added to the claim, it is the examiner's position to treat the claim as limited to a polyol with primary **and** secondary hydroxyl functional end groups.

9. Likewise, claim 8 incorporates the limitation "polyole is bi-functional and/or tri-functional" but also limits the ratio of bi-functional to tri-functional polyols. Because the ratio of bi- to tri-functional polyols is recited, it is the examiner's position to treat the claim as limited to a polyol with a combination of bi-functional **and** tri-functional polyols.

10. Also, claim 6 limits the polyols to a polyether glycol and/or polyester glycol. By definition, glycols have two functional groups. However, claims 7 and 8 note the use of tri-functional polyols. It is unclear whether the applicant intends to limit the polyols to bi-functional polyols or whether the applicant intends to also encompass triols.

#### ***Claim Objections***

11. Claims 7-15 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s)

in proper dependent form, or rewrite the claim(s) in independent form. Claims 7 and 8 note the use of tri-functional polyols. However, as noted before, claim 6 specifies that the polyol be bi-functional. Therefore, claims 7 and 8 fail to further limit claim 6.

***Claim Rejections - 35 USC § 102***

12. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

13. Claims 1, 3-7, 10, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Fishbein et al.

14. Fishbein discloses flame-resistant polyurethane foams, where the foams are made by reacting a tolylene diisocyanate with a polymeric polyol (abstract). Such a polyurethane would result in the applicant's Formula (I). The foams are laminated onto textile or other substrates (col. 6 lines 43-44). In a discussion of polymeric polyols, polyether polyols and polyester polyols are noted, with certain types of polyether polyols preferred. The reference indicates the use of ethylene oxide-tipped polyols having 20-70% primary hydroxyl groups (col. 2 line 63-col. 3 line 9). This equates to a ratio of primary to secondary hydroxyl groups of 1:4 to 7:3, falling within the claimed range. Ethylene oxide-tipped polypropylene oxide is noted as a suitable polyether polyol (col. 3 lines 10-22). Polyether triols should have molecular weights of 3000-6000 (col. 3 lines 7-9). Since the polyether polyols of the invention have the same general makeup and molecular weight as that of the claimed invention, it is the examiner's position that the

polyurethanes of Fishbein's invention would inherently possess the claimed value "n".  
See examples for showing the use of polypropylene oxide-polyethylene oxide polyols.

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1-8, 10-15, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mück et al. in view of Oertel.

17. Mück discloses an artificial leather composite comprising a fibrous sheet material and at least two layers of polyurethane elastomer (abstract). For the polyurethane materials, the use of diols or triols having a molecular weight of 400-400,000 is mentioned, including polypropylene oxide (col. 6 line 28-col. 7 line 42). An example shows a polyurethane prepolymer made by reacting polyoxyethylene glycol with diphenyl methane diisocyanate, which would fit the applicant's formula (I). Aromatic diisocyanates including tolylene diisocyanate and MDI are noted in the invention (col. 7 lines 15-47; examples). The composition is coated onto a textile support. It is the examiner's position that such a polyurethane would also fit the claimed n value. The reference suggests a value of at least one, and because of the broad claimed range and the low prepolymer molecular weights indicated (col. 6 lines 36-41), it is the examiner's position that the polyurethanes of the invention would inherently possess the applicant's

claimed  $n$  value. The polyurethanes may be coated onto a strippable layer, including polyolefin layers (col. 8 lines 5-24), suggesting a support layer of polyolefin. Grain may be imposed on the surfaces of the layers to create the appearance of artificial leather (col. 4 lines 35-51).

18. Regarding the thickness of the polyurethane layers, the examples show total composite thicknesses of 1.4-1.5 mm, where the fibrous layer should have a thickness of 0.8-5.0 mm (col. 5 lines 54-60). Thus, thin polyurethane layers are encompassed in the invention. Examples show product densities within the applicant's claimed ranges. Regarding the solids content of the material, note that the layers are thoroughly reacted and dried prior to completion (examples). Thus, the products would have no residual solvent or volatile chemicals present.

19. However, the reference does not suggest the use of a polyether polyol having a specified ratio of primary to secondary hydroxyl end groups. Oertel teaches that a common polyether polyol starting material, propylene oxide, is often reacted with ethylene oxide (p. 56-p. 57). In random polymerization using equivalent amounts of the two monomers, the ethylene oxide units are more reactive, leaving mostly secondary hydroxyl end groups (p. 58). The reference goes on to state that primary hydroxyl groups react three times faster than secondary hydroxyl groups, and so ethylene oxide is often added to the chain ends of propylene glycols (p. 62). The physical properties of polyether polyols can be modified by the degree of polymerization and ratio of propylene oxide to ethylene oxide (p. 63). By this teaching, it is the examiner's position that it would have been *prima facie* obvious to use a polyether polyol having the

appropriate amounts of propylene oxide and ethylene oxide present to optimize reactivity of the polyol. Such a modification would result in the modification of the applicant's claimed ratio.

20. Further, Mück does not specify the ratio of mixed diols to triols in the polyurethane reaction mixture. The reference does teach that diols and triols are suitable for use in the invention (col. 6 lines 27-56). These polyols form the soft, hydrophilic segment of the polyurethane, where the polyurethane material has improved elasticity (col. 6 line 51-col. 7 line 15; col. 3 lines 11-38). The crosslink density, aided by the use of triols, is important to the viscosity of the prepolymer reactant and to the overall elasticity (col. 3 lines 39-68). Thus, it is the examiner's position that it would have been prima facie obvious to use a blend of suitable polyols in any amounts necessary to optimize the crosslink density and elasticity of the resulting polyurethane layers.

21. Claims 1-12, 14-15, and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. in view of Oertel.

22. Lewis discloses compositions comprising polyurethane coatings for treating leather or leather substitutes (abstract). Other substrates include textiles, PVC, foams, and polyolefins (col. 5 lines 24-31). More than one polyurethane coating may be applied as desired (col. 4 lines 49-52). Coating layers are as thick as 8 mils (0.2 mm) (col. 4 lines 55-58), and the grained leather provides a grain in the composite (col. 4



lines 64-66). Examples show prepolymers of toluene diisocyanate with various polyether polyols, including polypropylene oxide glycol having a molecular weight of 2010 (col. 6). Hexamethylene diisocyanate is also a noted isocyanate in the invention (col. 2 lines 28-30). Such a polyurethane prepolymer would fit the applicant's formula (I), where n is at most an estimated 3 (maximum prepolymer weight of 6400/average repeat unit weight of 2184 based on toluene diisocyanate and polyol).

23. Regarding the solids content of the material, note that the layers are thoroughly reacted and dried prior to completion (col. 4 lines 58-63). Thus, the products would have no residual solvent or volatile chemicals present.

24. However, the reference does not suggest the use of a polyether polyol having a specified ratio of primary to secondary hydroxyl end groups. Oertel teaches that a common polyether polyol starting material, propylene oxide, is often reacted with ethylene oxide (p. 56-p. 57). In random polymerization using equivalent amounts of the two monomers, the ethylene oxide units are more reactive, leaving mostly secondary hydroxyl end groups (p. 58). The reference goes on to state that primary hydroxyl groups react three times faster than secondary hydroxyl groups, and so ethylene oxide is often added to the chain ends of propylene glycols (p. 62). The physical properties of polyether polyols can be modified by the degree of polymerization and ratio of propylene oxide to ethylene oxide (p. 63). By this teaching, it is the examiner's position that it would have been prima facie obvious to use a polyether polyol having the appropriate amounts of propylene oxide and ethylene oxide present to optimize

reactivity of the polyol. Such a modification would result in the modification of the applicant's claimed ratio.

25. Further, Lewis does not specify the ratio of mixed diols to triols in the polyurethane reaction mixture. The reference does teach that diols and triols and their mixtures are suitable for use in the invention (col. 2 lines 10-20). The polyols contribute to the flexibility of the polyurethane coating (col. 1 lines 26-35). Thus, it is the examiner's position that it would have been prima facie obvious to use the diols and triols in admixture in any amounts necessary to optimize the flexibility of the resulting coating.

26. Claims 1-7, 28, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura in view of Oertel.

27. Nishimura discloses a leather-like material having a fibrous substrate layer, a porous polyurethane surface layer, a polyurethane surface coating, and another polyurethane coat layer (abstract). The substrate includes various textiles (col. 4 lines 10-26). Polyurethane I, of the surface layer, is a reaction product of a polymer diol having a molecular weight of 500-3000, including polyether and polyester diols (col. 5 lines 3-17) and an aromatic diisocyanate including tolylene and diphenylmethane diisocyanates (col. 5 lines 18-36). Polypropylene ether glycol is mentioned as a polyether glycol. Polyurethane II, a surface layer coating, is a reaction product of a polymer diol having a molecular weight of 500-3000, including polyether and polyester diols (col. 6 lines 39-57) and an aliphatic diisocyanate including hexane and isophorone

diisocyanates (col. 6 lines 58-68). Polypropylene ether glycol is mentioned as a polyether glycol. The surface layer has an apparent density of up to 0.48 g/ml (col. 2 lines 19-25). Example 2 exhibits a surface coating made from polyoxyethylene glycol having a molecular weight of 2000, a polyester glycol, isophoronediiisocyanate, and a diamine, which is coated onto a polyurethane foam surface layer. It is the examiner's position that the polyurethanes of the invention fit the applicant's formula (I) because of the reactants used, including the n value of the repeat units. The reference suggests a value of at least one, and because of the broad claimed range, it is the examiner's position that the polyurethanes of the invention would inherently possess the applicant's claimed n value.

28. However, the reference does not suggest the use of a polyether polyol having a specified ratio of primary to secondary hydroxyl end groups. Oertel teaches that a common polyether polyol starting material, propylene oxide, is often reacted with ethylene oxide (p. 56-p. 57). In random polymerization using equivalent amounts of the two monomers, the ethylene oxide units are more reactive, leaving mostly secondary hydroxyl end groups (p. 58). The reference goes on to state that primary hydroxyl groups react three times faster than secondary hydroxyl groups, and so ethylene oxide is often added to the chain ends of propylene glycols (p. 62). The physical properties of polyether polyols can be modified by the degree of polymerization and ratio of propylene oxide to ethylene oxide (p. 63). By this teaching, it is the examiner's position that it would have been prima facie obvious to use a polyether polyol having the appropriate amounts of propylene oxide and ethylene oxide present to optimize

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reactivity of the polyol. Such a modification would result in the modification of the applicant's claimed ratio.

29. Claims 8, 10-11, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fishbein et al.

30. Fishbein applies as above, failing to specify a mixture of diols and triols in the claimed ratio. However, Fishbein teaches the use of both diols and triols, where blends of polyols are exemplified (col. 2 line 63-col. 3 line 63; examples). Since any of the suitable polyols are capable of forming a polyurethane foam having improved flame resistance (col. 1 lines 54-60), it is the examiner's position that blends of any of the suitable polyols would result in equally improved flame resistant properties. The chosen polyols also affect the shrinkage properties of the foams (col. 3 lines 26-63). Thus, it would have been prima facie obvious to use blends of diols and triols in any amount necessary to optimize the flame resistant and shrinkage properties of the foams.

31. Regarding claims 11 and 14, the reference forms solid foam layers from a given set of reactants (examples). Since the products are solid and do not contain unreacted volatile organic chemicals, it is the examiner's position that the foams of the reference encompass the applicant's claimed solids content and VOC content of the resulting formed layers.

***Double Patenting***

32. Applicant is advised that should claim 5 be found allowable, claim 6 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Response to Arguments***

33. Applicant's arguments with respect to claims 1-15 and 28-31 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bissett whose telephone number is (703) 308-6539 or (571) 272-1068 after December 2003. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

mdb

  
RABON SERGENT  
PRIMARY EXAMINER